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(56) Documents cited

GB A	2092472	GB	0671179
GB	1411753	GB	0508934
GB	1129169	GB	0235617
GB	1072791		

(58) Field of search  
B1T

(54) Suction cleaner

(57) A hand-held suction cleaner has a dirt receptacle in the form of a drawer containing a filter for dirt-laden air. A portion of the drawer is transparent to facilitate a visual check of the contents of the drawer. The filter may be a porous flat wall of the drawer or may be a pleated porous sheet inside the drawer.

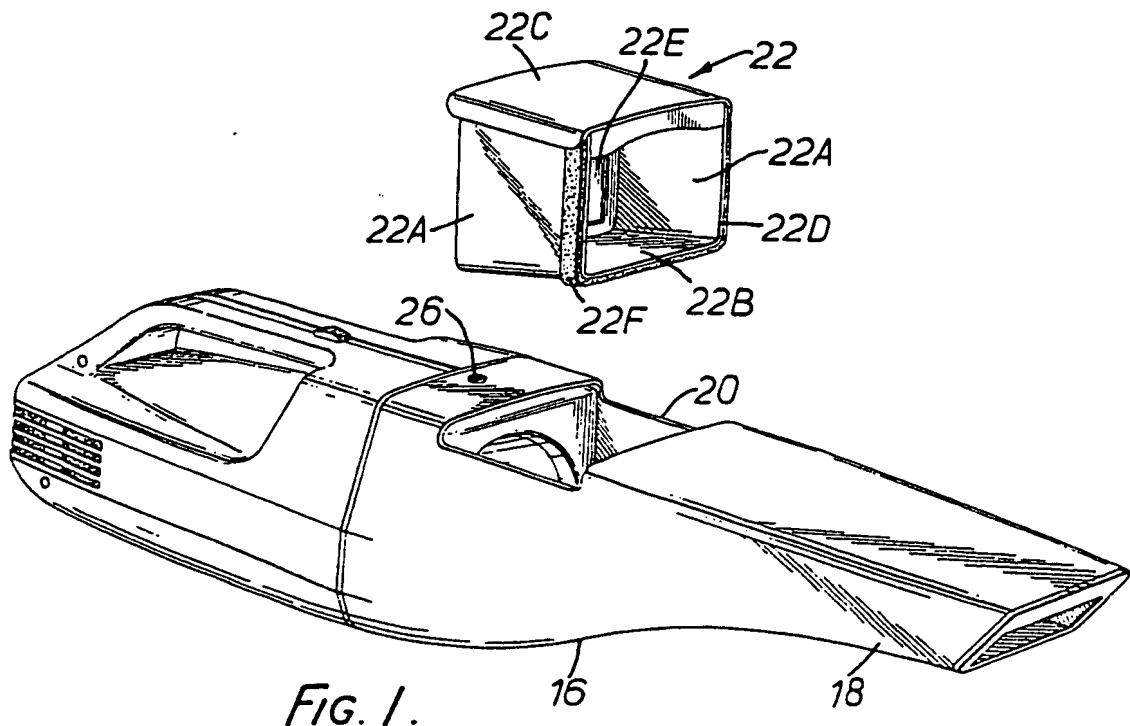


FIG. 1.

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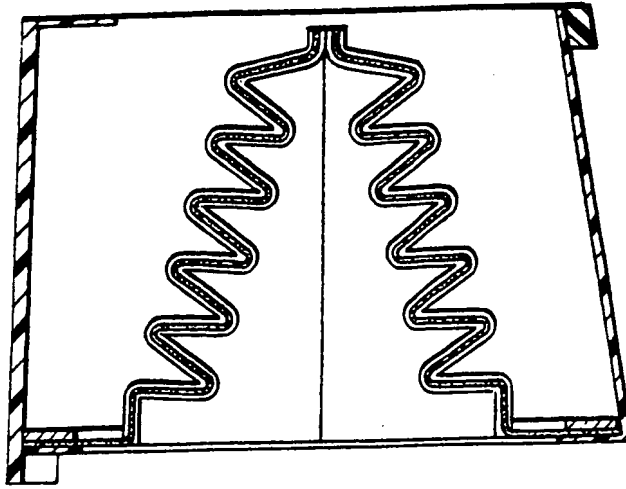


FIG. 3.

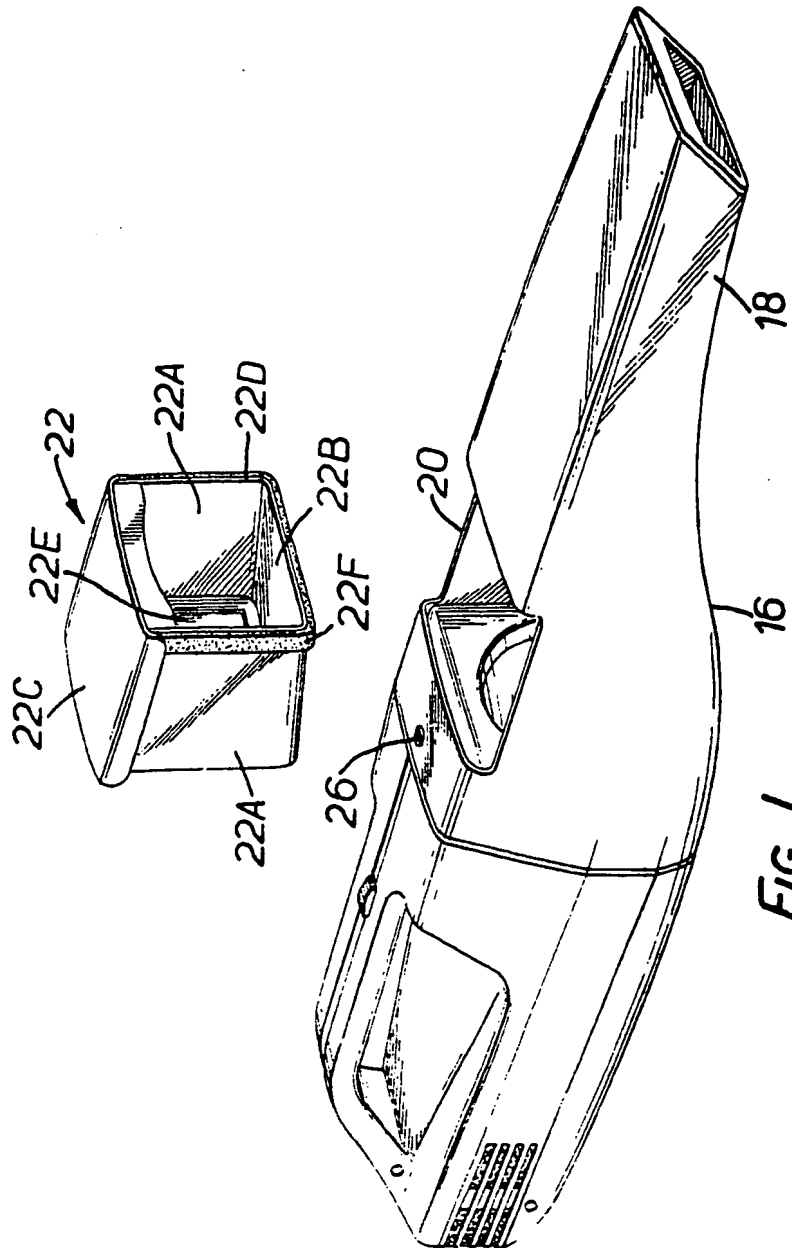
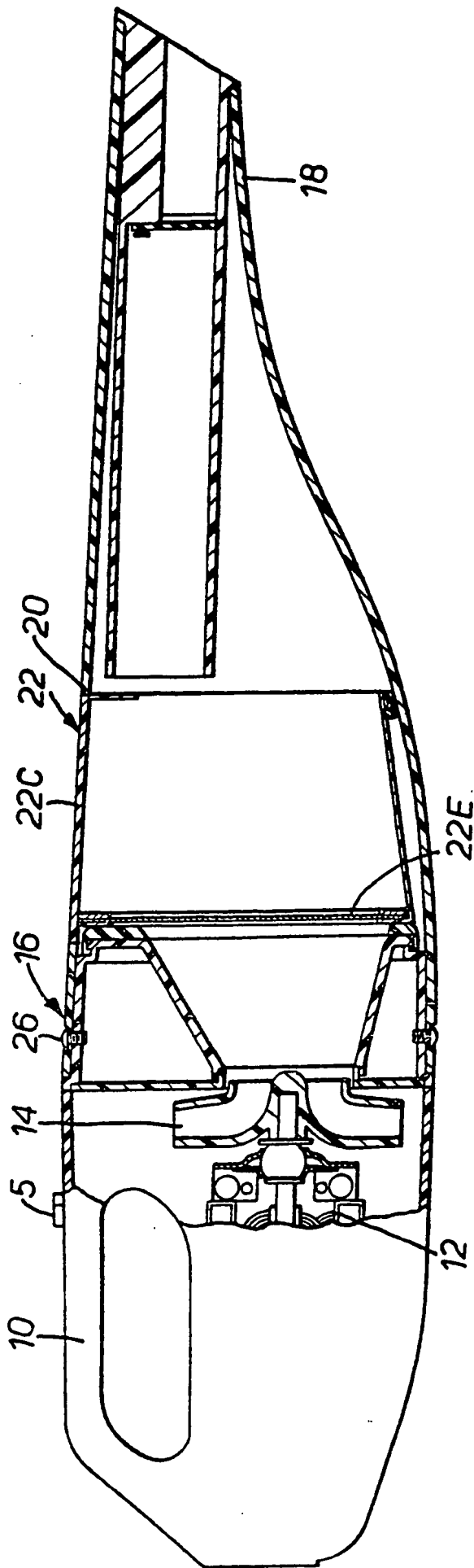


FIG. 1.



## SPECIFICATION Suction Cleaner

This invention relates to suction cleaners and particularly, but not exclusively, to suction cleaners of the hand-held type which might either be driven by batteries, for example of the rechargeable type, carried by the cleaner itself, or be mains operated.

Such cleaners are well known and are particularly useful for cleaning on a relatively small scale and in relatively inaccessible places such as within cars. They are also particularly convenient for use for short periods for example where only a small area of carpet has to be cleaned, perhaps due to a small spillage of crumbs and it is not necessary, or particularly convenient, quickly to use the larger type of cleaner.

With such a hand-held cleaner, the volume of dirt to be picked up is much less than with the larger cleaner and consequently the dirt-capacity of the cleaner can be substantially smaller. Despite this, it is very desirable to provide a simple system for disposing of the dirt. For this purpose certain prior proposals provide for the cleaner to be separable into two halves about a parting plane, one of the halves being intended to comprise a receptacle, to retain the dirt and to be carried to a dustbin. Such a construction involves a relatively complex latching and sealing arrangement for the two halves which have to be capable of withstanding continual separation. It is also found that in some instances the filter, which is used to separate the dirt from the air stream, tends to get dirt clinging to it and therefore, when separating the two halves of the cleaner for emptying purposes, there is a tendency for dirt to be displaced from the filter during emptying.

The present invention in its different aspects aims to alleviate or overcome these disadvantages.

According to one aspect of the present invention a suction cleaner has a duct extending between a fan and an air entry, a portion of the duct containing a removable drawer-like dirt receptacle. A portion of the receptacle may for example be contoured normally to close an opening the outer wall of the cleaner through which the receptacle is withdrawn for emptying purposes. This portion of the receptacle is preferably transparent in order to be able to check the capacity of the drawer. The direction of withdrawal may be transverse to the direction of flow of air through the duct. Desirably the receptacle is generally box like and has an opening in one side which faces towards the air entry.

A particularly convenient arrangement embodies the filter as part of the receptacle so that the filter is withdrawn from the cleaner with the receptacle, during emptying. For example the filter may comprise a sheet of material forming a wall of the receptacle, and removable therefrom for replacement purposes.

In an alternative arrangement the filter may comprise a concertina-like construction positioned within the confines of the receptacle. Such an arrangement has the advantage of increasing the filter area, perhaps at the expense of dirt capacity of the receptacle. A compromise between these two conflicting requirements can of course be obtained by careful design.

The receptacle and/or the duct preferably carry sealing means to prevent dirt escaping from the opening of the duct, and also to prevent loss of suction by air being drawn into the duct through the opening. With a suction-fan arrangement all parts of the duct are normally at sub-atmospheric pressure so that sealing to prevent escape of dirt is not a significant problem.

The invention may be carried into practice in various ways but two specific embodiments will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is a perspective view of a hand-held cleaner embodying the present invention and showing its dirt-drawer in a withdrawn condition;

Figure 2 is a part sectional-side elevation of the cleaner of Figure 1 with the drawer in its operative position, and

Figure 3 is a sectional view of an alternative dirt drawer.

The cleaner shown in the drawing is of the hand-held type and includes, to the left in Figure 2, a handle 10 beneath which is a horizontal-axis motor 12, the shaft of which carries a centrifugal-type fan 14. The motor is actuated by a push switch 15.

To the right of the motor 12, the body of the cleaner has a wedge-shaped portion 16 terminating at its right-hand end in a nozzle 18 through which dirt-laden air is drawn by the fan.

Adjacent to the fan 14 the upper wall of the wedge-shape portion 16 has a generally rectangular opening 20 through which a dirt-drawer 22 can be inserted into and withdrawn from its operative position.

The drawer 22 is generally box-like and has a pair of side-walls 22A, a bottom wall 22B, and a top wall 22C, the latter being transparent and being received closely within the opening 20 to follow the contour of the surrounding body of the cleaner.

On its right-hand side the drawer has a rectangular aperture 22D, and on its left-hand side the drawer has a filter wall or screen 22E formed by a piece of sheet filter material. The filter wall 22E is removable from the drawer for replacement purposes.

Adjacent the aperture 22D the side and bottom walls of the drawers carry strips of sealing material 22F. Other seals may be provided on the drawer and/or on the cleaner body, as required, both to prevent leakage of the dirt outwards and leakage of air inwards.

The left hand portion of the cleaner, which includes the handle and motor may either be

permanently secured to the wedge shaped portion 16, or one or more screws 26 may be provided to enable separation for servicing.

In operation, the cleaner sucks up dirt from the floor through the nozzle 18 and this is separated by the filter wall 22E, the dirt falling into the remainder of the drawer. Whilst there may be a tendency for some dirt to fall to the right, out of the drawer when it is necessary to empty the drawer, the cleaner is tilted through 90 degrees with the nozzle 18 then uppermost, and a gentle shake or knock will cause the dirt to settle into the drawer. The drawer can then be simply withdrawn, emptied and replaced. If necessary the filter wall 22E can be replaced at this stage.

The provision in this arrangement of a filter which is carried by the drawer is found to be a particularly attractive feature since it avoids difficulty of dirt spillage which can arise if attempts are made to leave the filter behind in constructions when two parts are separated for dirt emptying purposes.

Figure 3 shows an alternative form of filter of generally concertina shape, the length of being such that it is entirely in the confines of the remainder of the drawer.

In using the arrangements according to the present invention, when removing the drawer, the cleaner is turned in the direction which positions the heaviest part, i.e. the handle-end containing the motor, lowermost. This is particularly convenient and has advantages over certain prior arrangements where the heavier end of the cleaner has to be turned upwards before separating the two halves of the cleaner.

Although the filter wall or screen 22E is shown as occupying substantially the whole of the cross-sectional area of the drawer at the left-hand end of the drawer it may occupy only a part of the cross-sectional area of either or both of the left and right-hand ends.

## CLAIMS

1. A suction cleaner having a duct extending between a fan and an air entry, a portion of the duct containing a removable drawer-like dirt receptacle.

2. A suction cleaner as claimed in claim 1 in which a portion of the receptacle is contoured normally to close an opening in the outer wall of the cleaner, through which the receptacle is withdrawn for emptying purposes.

3. A suction cleaner as claimed in claim 2 in which the said portion of the receptacle is transparent in order to facilitate a visual check of the capacity of the drawer.

4. A suction cleaner as claimed in claim 2 in which the direction of withdrawal is transverse to the direction of flow of air through the duct.

5. A suction cleaner as claimed in any one of the preceding claims in which the receptacle is generally box-like and has an opening in one side which faces towards the air entry.

6. A suction cleaner as claimed in any one of the preceding claims in which a filter is formed as part of the receptacle so that the filter is withdrawn from the cleaner with the receptacle, during emptying.

7. A suction cleaner as claimed in claim 6 in which the filter comprises a sheet of material forming a wall of the receptacle, the filter being removable from the receptacle for replacement purposes.

8. A suction cleaner as claimed in any one of claims 1 to 6 in which the filter comprises a concertina-like construction positioned within the confines of the receptacle.

9. A suction cleaner as claimed in any one of the preceding claims in which the receptacle and/or the duct carry sealing means to prevent dirt escaping from the opening in the duct.

10. A suction cleaner substantially as specifically described herein with reference to the accompanying drawings.